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EDITORIAL

Presenting science

Sitting in innumerable lectures and seminars in darkened rooms, staring at indistinct slides while a soporific speaker drones on, is one of the occupational hazards of a scientific career. In crowded and poorly ventilated seminar halls, the effects of oxygen depletion and carbon dioxide enrichment are quickly visible as the less resilient members of the audience slowly drop off to sleep. Physiological insults apart, speakers too contribute to the generally sedative effects of most seminars. Not surprisingly, it is customary to serve coffee before seminars, presumably in the hope that caffeine will succeed where speakers generally fail. I was recently in the audience when a large group of recent Ph Ds from across the country, made brief presentations of their research work. With very few exceptions, the ability to articulate and the even more important quality of thinking clearly and simply were notably absent. Senior scientists are sometimes no better. Attendance at any major symposium will clearly reveal that the quality of scientific presentations is generally woefully inadequate. In these days of declining verbal and written skills of students entering science, we might do well to wonder if greater attention needs to be paid to teaching the skills of effective scientific presentations. The management and marketing professionals very often, worry primarily about packaging and advertising; presentation is indeed almost always the key to commercial success. A technically superior product can fall by the wayside, while an adequate but inferior competitor is swept to success by 'imaginative marketing'. Unfortunately, in these times, even something as pristine as science needs to be effectively sold. To sell science, scientists must be good salesmen (the politically correct, 'salesperson' somehow does not sound correct). Inarticulate, poorly organized, sometimes ill-informed and inadequately prepared presenters can hardly do the job.

This brings us back to the original theme – what indeed constitutes a minimum requirement for an effective scientific presentation? Undoubtedly, the speaker must know what he or she is talking about, an obvious requirement but one that does not always seem to be fulfilled. With slides and transparencies now being the norm, the least that one can demand is that these are legible. Gone are the days, when speakers wrote neatly and carefully on blackboards (later 'greenboards') allowing audiences the time to follow the drift of an argument. The painstaking drawing of chemical structures or the slow evolution of complex equations was sometimes a pleasure to behold. Instead, we now have lectures packed with slides or overheads, some containing so much material ('busy' is a curiously American description), that an audience is soon benumbed into stupefaction. At the other extreme are the 'corporate scientists' with PowerPoint presentations, bewildering for their varied colour backgrounds, but generally devoid of data and confined to well-known generalities. Most often the presentations made at symposia, by scientists from companies are an insult to the intelligence of any member of the audience interested in science. Their defence is usually corporate paranoia about secrecy. Why then participate in symposia? The next money-making breakthrough might as well be achieved in studied silence. There are also some speakers who hide the material on their transparencies with a sheet of paper, driving the more curious members of the audience to distraction. At a recent symposium I heard an overseas visitor remark that Richard Feynman would under such circumstances, walk up and strip the offending mask away. We also have speakers who have as many as fifty slides for a twenty-minute presentation, spend as much as half the time gripping the podium and talking on and on without even beginning the display.

But these are superficial problems which can presumably be adjusted by appropriate coaching; practice under a coach's watchful eye is something that should not be restricted to sports alone. The more fundamental issue is that a large number of 'scientists' and 'prospective scientists' do not seem to be clear about their own goals, the implications of their results in the context of their fields of specialization and the inherent

limitations of their own approaches. In a country like India, with widely dispersed research laboratories of differing quality and infrastructure, it is necessary that investigators are at least aware of limitations. Unfortunately, a large cross-section seems to live in a world of fantasy, imagining a scientific relevance for work that should not have been undertaken in the first place. The blame lies primarily in the unfettered recognition accorded to universities to award Ph D degrees, with many research supervisors not fulfilling any of the real requirements that are necessary before they act as mentors. For this sorry state of affairs, the University Grants Commission, the Academic (?) bodies of the universities and indeed the scientific community as a whole must bear the responsibility.

In seminars featuring speakers from the West, there appears to be greater attention to detail, more discipline in sticking to allotted time limits and clearer take home messages. In most universities in America and many in Europe, training students for presentations is automatic, since there are many reviews, group meetings and departmental requirements that necessitate oral presentations. These practices appear to be restricted to relatively few institutions in India. Most universities and their faculties appear to have abdicated all collective responsibility with regard to the training of Ph D students. The enormous variation in quality and performance of Ph Ds produced in our innumerable institutions is a clear reflection of the deficiencies of our academic system.

But raw Ph Ds are not the only offenders who perform in front of despairing audiences. What can one say when senior scientists present jumbled slides in random orientations and cut into the time of speakers to follow in meetings and symposia? Fortunately on most occasions few non-scientists are present. Otherwise they may really wonder whether scientists whose presentations are confused and badly organized are completely in control of their science. Anticipating criticism, I must say that there have been great scientists who have been inarticulate in public; Neils Bohr reportedly among them. But then being inarticulate is not a necessary and certainly not a sufficient condition for doing good science.

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